

SCIENTIFIC METHOD AND BLOOD FLOW

INTRODUCTION:

In this lab you will learn to form a hypothesis, conduct experiments around that hypothesis, and collect and analyze data. One of the most important characteristics of modern science is its quantitative approach to solving problems. One of the first scientists to use quantitative methods was William Harvey, who discovered that blood circulated through the body. At the time Harvey began his work, anatomists believed that the liver produced blood from the food that the body consumed. The blood was then carried by veins to the heart, purified in the lungs, and then pumped to the various organs of the body, where it was consumed. Harvey measured that the left ventricle of the heart held roughly 100 ml of blood. He also measured that the heart beats an average of 64 times per minute.

QUESTION 1:

From the information above, and assuming that 1 ml of blood weighs 1 g, how much blood would the body need to produce per hour in (g/hr.) to replace the blood consumed by the organs? _____ g/hr.

Harvey hypothesized that the same blood must circulate continuously throughout the body.

MATERIALS:

Watch with second hand, or clock

PROCEDURE:

1. While sitting quietly at your desk, find the pulse in your wrist and count the beats for one minute. You and your lab partner can do this on yourselves, or each other. Record the names of both subjects and their beats per minute heart rate on DATA TABLE 1 as sample 1.

2. Repeat step 1 two more times for each subject. Record the data in the appropriate place on DATA TABLE 1.
3. Calculate the average pulse rate for each subject and record the results on DATA TABLE 1.

How do you think standing or holding your breath will affect your pulse rate?

QUESTION 2:

Choose one of these activities and formulate a hypothesis about its effect on pulse rate. What is the independent variable? What is the dependent variable?

Hypothesis _____

Independent Variable _____

Dependent Variable _____

4. Repeat steps 1, 2, and 3 for each subject, this time with the subjects standing or holding their breath. Record your data and calculations in the appropriate DATA TABLE

Conclusion: Compare your data from step 4 with your data from step 3.

1. How do your results in step 4 compare with the hypothesis you made?
2. What measurement did you use as a control in this investigation?
3. What are some possible sources of error in this experiment?